PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference CH920010024	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/IB 02/04853	International filing date *(day/month/year)* 21.11.2002	Priority date *(day/month/year)* 15.01.2002
International Patent Classification (IPC) or both national classification and IPC G12B21/00		
Applicant INTERNATIONAL BUSINESS MACHINES CORPORATION et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 4 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
07.08.2003	26.02.2004
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Grand, J-Y Telephone No. +49 89 2399-2472

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IB 02/04853

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-20 as originally filed

Claims, Numbers

1-25 received on 15.12.2003 with letter of 11.12.2003

Drawings, Sheets

1/6-6/6 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-25
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-25
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-25
	No:	Claims	

2. Citations and explanations

   see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement.

Reference is made to the following documents:

D1 = WO-A-00/19494

D2 = VETTIGER P. ET AL: "The Millipede-more than one thousand tips for future AFM data storage" IBM JOURNAL OF RESEARCH AND DEVELOPMENT, IBM CORPORATION, ARMONK, US, vol. 44, no. 3, May 2000 (2000-05), pages 323-340, XP002194187 ISSN: 0018-8646

D3 = US-A-5 773 921

1. Technical Field

The application relates to microstructures.

2. Novelty (Art. 33(2) PCT) - Independent method claim 1

D1 does not discloses the steps of depositing microstructure material on a substrate to embed a nanotube in the microstructure material, and finally detaching the substrate to release the microstructure. D2-D3 do not disclose those features either, therefore the subject-matter of **claim 1** is novel (Article 33(2) PCT).

3. Inventive Step (Art. 33(3) PCT) - Independent method claim 1

Document D1 represents the closest prior art.

This document discloses a method for forming a microstructure (title, abstract and figures); comprising

- depositing a seed material on a substrate ("nanotube catalyst" in claim 1, fig. 2A-2E and 3A-3D); and
- growing a nanotube from the seed material ("synthetising a carbon nanotube" in claim 1).

The subject-matter of D1 differs from the subject-matter of claim 1 in that the steps of depositing microstructure material on the substrate to embed the nanotube in the microstructure material, and finally detaching the substrate to release the microstructure are not present.

The problem to be solved by the present invention may therefore be regarded

as to propose an alternative way to form a microstructure.
The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:
No available document hints at depositing microstructure material on the substrate to embed the nanotube in the microstructure material, and finally detaching the substrate to release the microstructure, causing the advantage of forming tip assemblies of optimal quality, durability and versatility that can be manufactured cheaply, **claim 1** meets therefore the requirements of inventive step referred to in Art. 33(3) PCT.

4. Dependent Claims

Claims 2-25 are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

5. Industrial Applicability

Without any doubts the application as defined in **claims 1-25** is industrially applicable.